

Connecting SMW to statistical data

SMW in SMART project

Benedikt Kämpgen, David Riepl

Institute of Applied Informatics and Formal Description Methods (AIFB)



Use case: SMART project

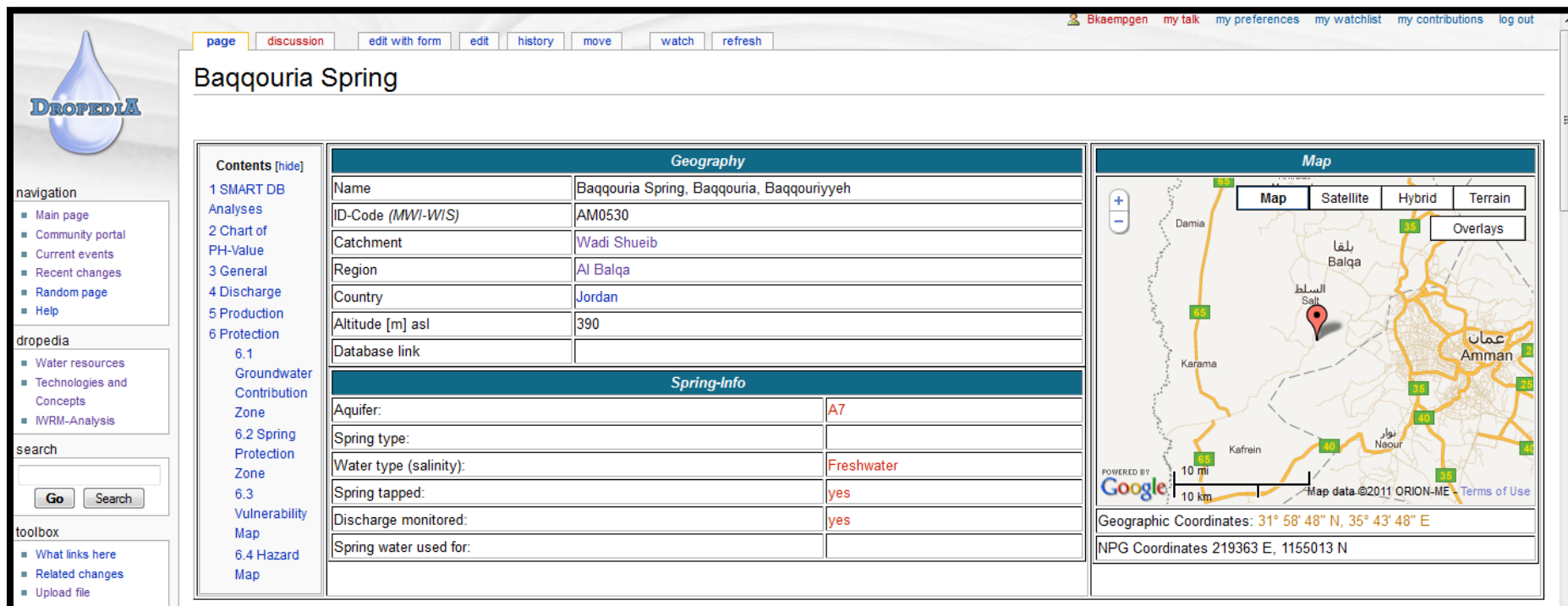
- SMART 2 - Sustainable Management of Available Water Resources with **Innovative** Technologies
- Integrated **Water Resource Management** in the Lower Jordan Rift Valley
- SMW shall help scientists and decision makers to collaborate and share knowledge to improve the situation

■ Dropedia  SMART DB



Dropedia

- SMW (+ Semantic Forms, Semantic Maps, Result Formats, Rich Media...)
- In Dropedia, locations are stored and annotated, e.g., springs, wells, monitoring stations, cities



The screenshot shows the Dropedia web application interface. The top navigation bar includes links like 'page', 'discussion', 'edit with form', 'edit', 'history', 'move', 'watch', and 'refresh'. The user 'Bkaempgen' is logged in, with links for 'my talk', 'my preferences', 'my watchlist', 'my contributions', and 'log out'.

The main content area is titled 'Baqqouria Spring'. It features a 'Contents [hide]' sidebar with a tree structure: 1 SMART DB, Analyses, 2 Chart of PH-Value, 3 General, 4 Discharge, 5 Production, 6 Protection, 6.1 Groundwater Contribution Zone, 6.2 Spring Protection Zone, 6.3 Vulnerability Map, and 6.4 Hazard Map.

The main content is divided into two sections: 'Geography' and 'Spring-Info'.

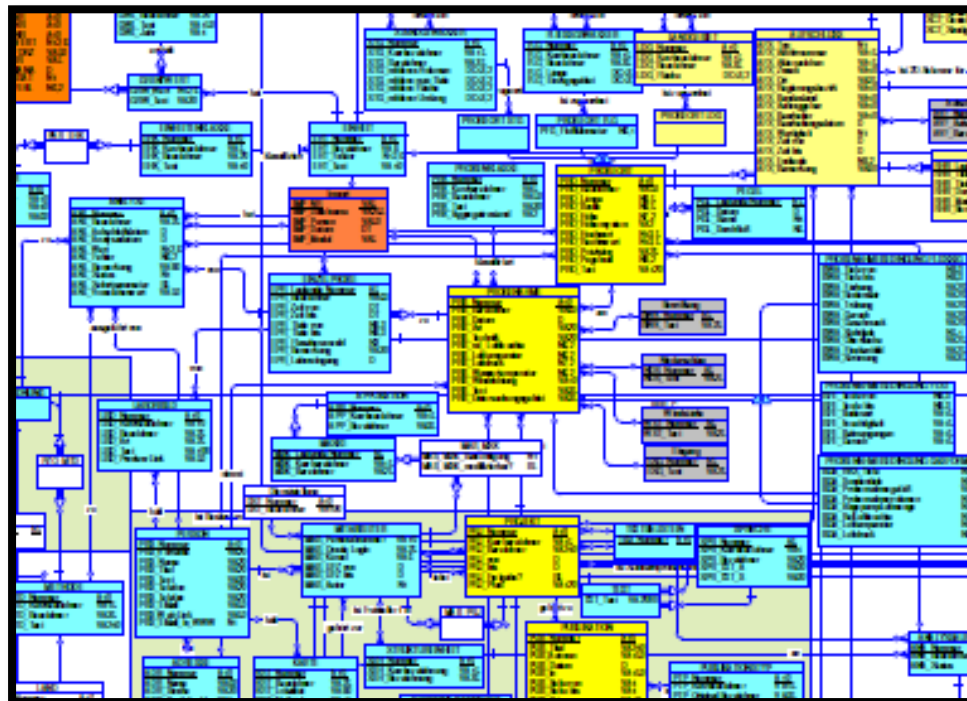
Geography	
Name	Baqqouria Spring, Baqqouria, Baqqouriyeh
ID-Code (MWI-WIS)	AM0530
Catchment	Wadi Shueib
Region	Al Balqa
Country	Jordan
Altitude [m] asl	390
Database link	

Spring-Info	
Aquifer:	A7
Spring type:	
Water type (salinity):	Freshwater
Spring tapped:	yes
Discharge monitored:	yes
Spring water used for:	

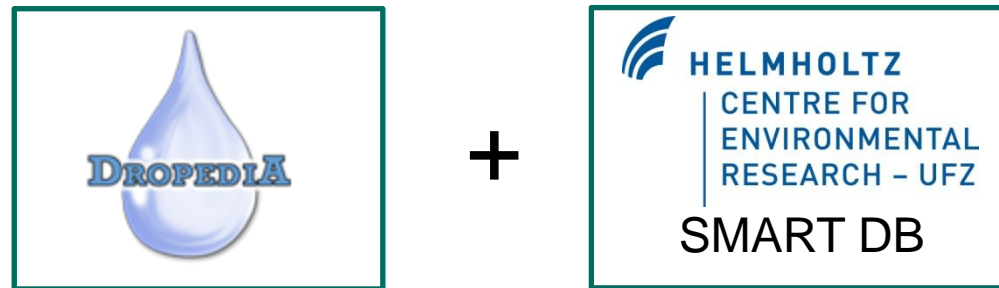
On the right, there is a 'Map' section with a Google Map of the area. The map shows the location of Baqqouria Spring (marked with a red pin) near the town of Balqa. The map includes a scale bar (10 km) and geographic coordinates: 31° 58' 48" N, 35° 43' 48" E. The NPG coordinates are 219363 E, 1155013 N.

SMART DB

- Oracle DB, storing statistical data
- Complex schema
- E.g., precipitation in Ira Meteo from 1986 to 2006

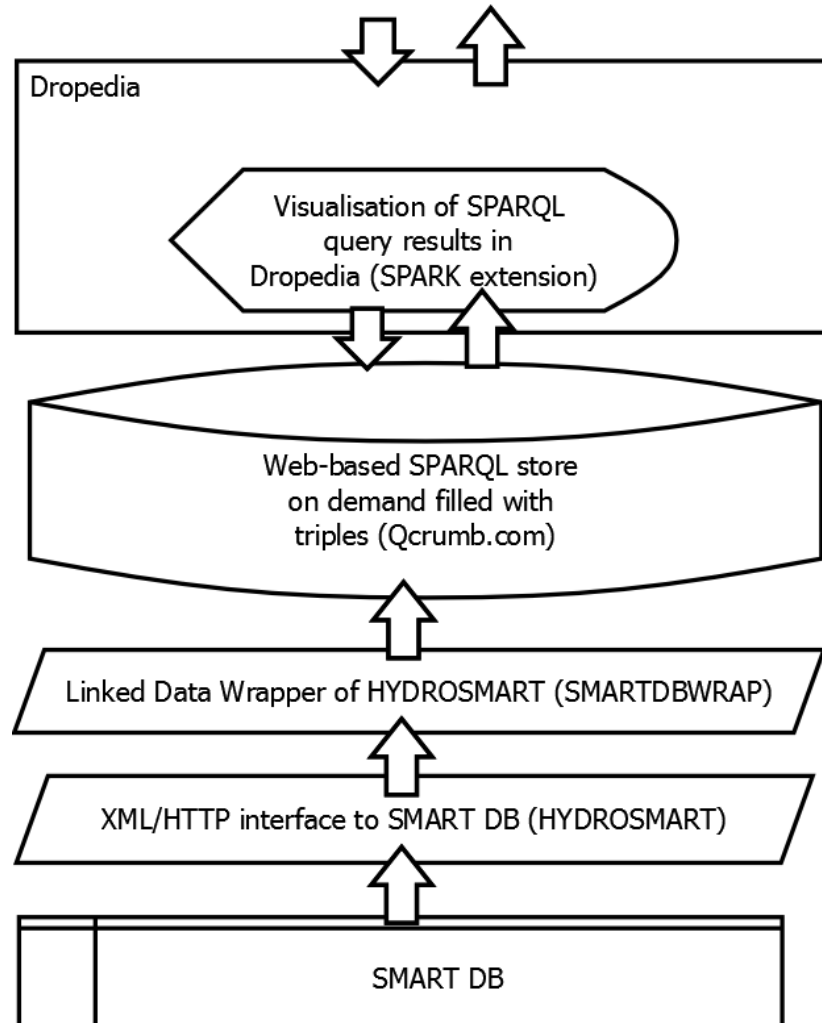


Recent work: Connection between Dropedia and SMART DB

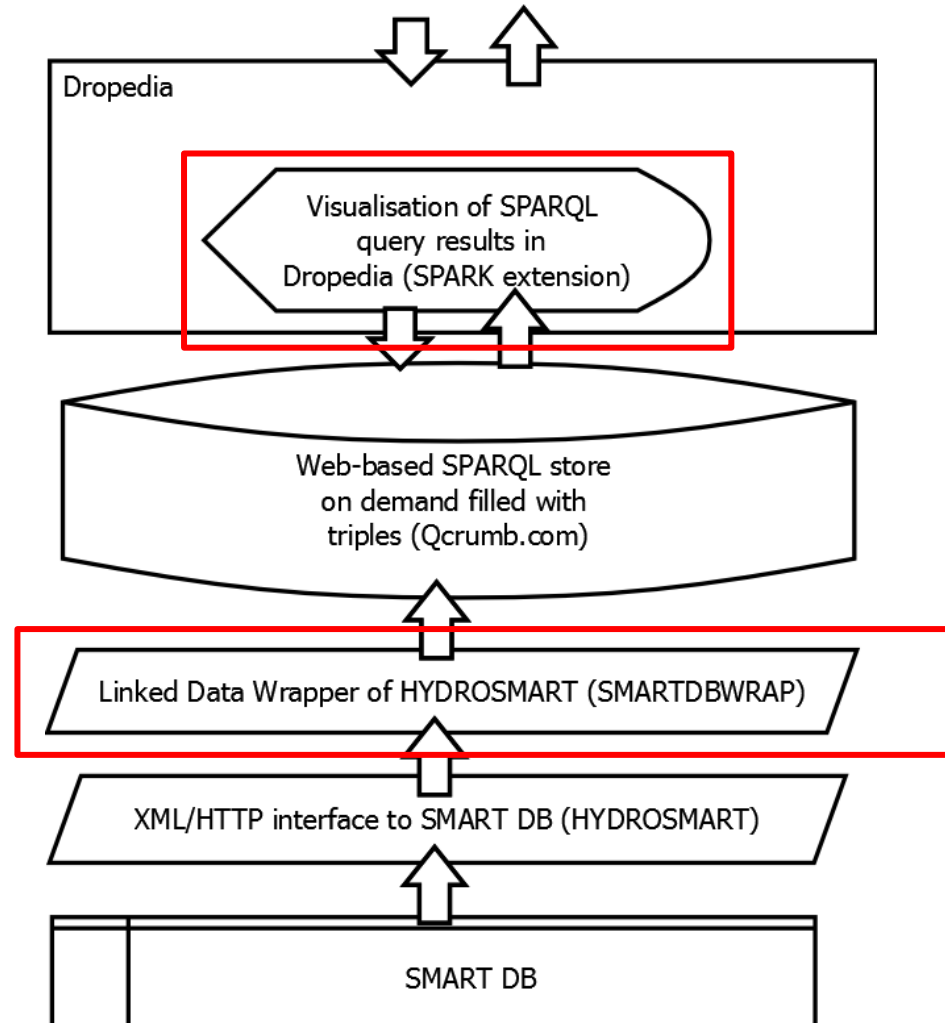


How to collaboratively analyse data inside SMART DB using Dropedia?

Connection between Dropedia and SMART DB – Solution



Connection between Dropedia and SMART DB – Solution



Linked Data Wrapper

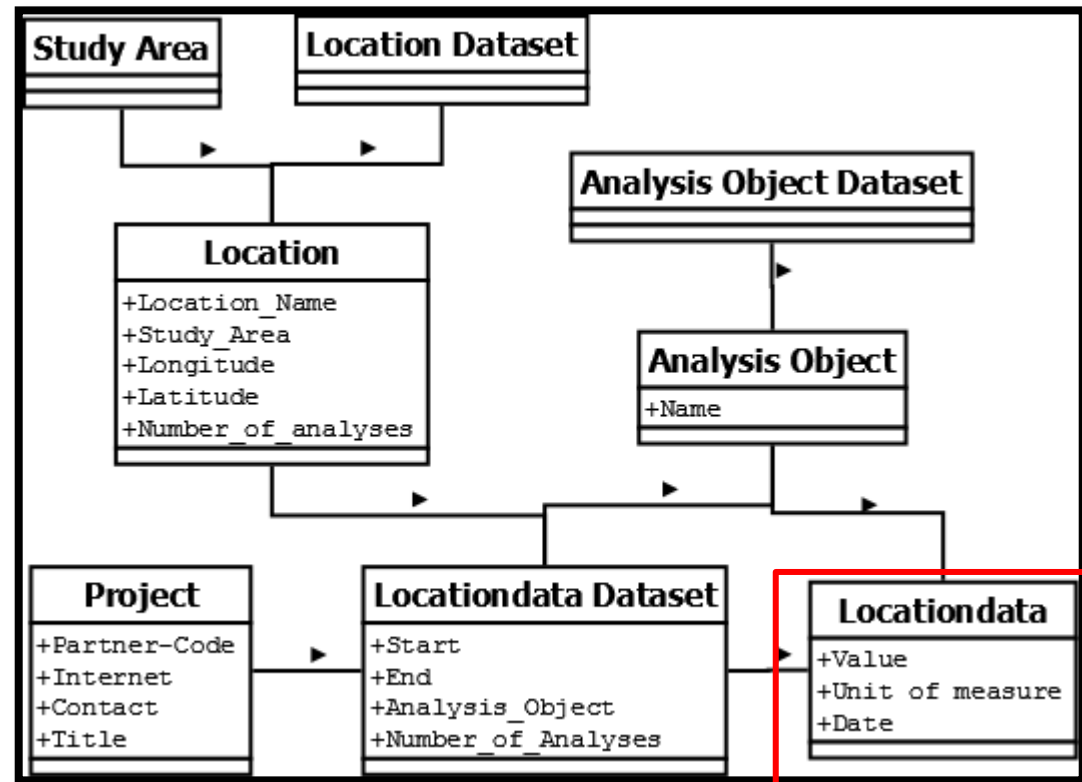
■ Google App Engine transforming XML from HYDROSMART into Linked Data

- URIs for locations, locationdata
- Access through HTTP
- Information as RDF

```

- <rdf:RDF>
- <rdf:Description rdf:about="">
  - <rdfs:comment>
    No guarantee of correctness! USE AT YOUR OWN RISK!
  </rdfs:comment>
  - <dc:publisher>
    UFZ research inside SMART - DAISY (German Research Data Infrastructure)
  </dc:publisher>
  </rdf:Description>
- <qbm:DataSet rdf:about="/id/location/ds">
  <rdfs:label>UFZ SMART: Location Datasets
</qbm:DataSet>
- <rdf:Description rdf:about="/id/locationdata">
  <smart:analysis_Object rdf:resource="/id/analysis/object">

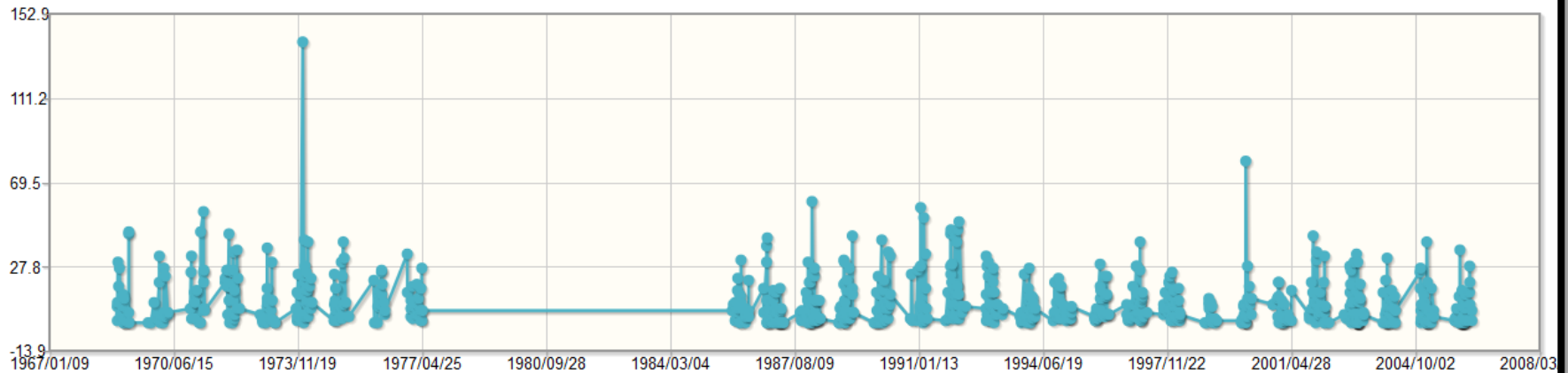
```



SPARK extension in Dropedia

Precipitation

[edit]



```

==Precipitation==
<spark endpoint="http://qcrumb.com/sparql"
      format="http://129.13.109.100/~dropedia/extensions/Spark/rdf-spark/jquery.spark.datechart.js"
      timeformat="%dd.%mm.%yy"
      query="
PREFIX smart: <http://smartdbwrap.appspot.com/>
PREFIX qb: <http://purl.org/linked-data/cube#>

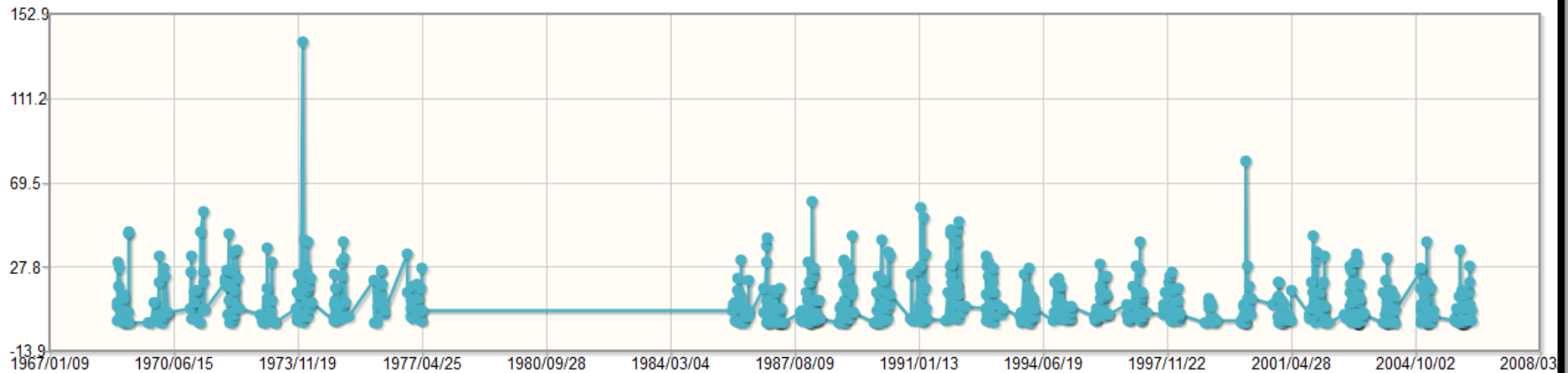
SELECT ?entity ?series ?series_label ?time ?value
from <http://smartdbwrap.appspot.com/data/locationdataset/{ID-Code| }/precipitation>
where {
?entity a qb:Observation.
?entity smart:project_Namedataowner ?DataOwner.
?entity smart:study_Area ?StudyArea.
?entity smart:study_Area ?series.
?entity smart:study_Area ?series_label.
?entity smart:location_Name ?LocationName.
?entity smart:analysis_Object ?AnalysisObject.
?entity smart:date ?time.
?entity smart:analysis_Value ?value.
?entity smart:analysis_Unit ?Unit
}
">loading</spark>

```

SPARK extension in Dropedia

Precipitation

[edit]



```
==Precipitation==
```

```
<spark endpoint="http://qcrumb.com/sparql"
format="http://129.13.109.100/~dropedia/extensions/Spark/rdf-spark/jquery.spark.datechart.js"
timeformat="%dd.%mm.%yy"
query="
```

```
PREFIX smart: <http://smartdbwrap.appspot.com/>;
```

```
PREFIX qb: <http://purl.org/linked-data/cube#>;
```

```
SELECT ?entity ?series ?series_label ?time ?value
from <http://smartdbwrap.appspot.com/data/locationdataset/{ID-Code| }/precipitation>;
where {
?entity a qb:Observation.
?entity smart:project_Namedataowner ?DataOwner.
?entity smart:study_Area ?StudyArea.
?entity smart:study_Area ?series.
?entity smart:study_Area ?series_label.
?entity smart:location_Name ?LocationName.
?entity smart:analysis_Object ?AnalysisObject.
?entity smart:date ?time.
?entity smart:analysis_Value ?value.
?entity smart:analysis_Unit ?Unit
}
```

```
">loading</spark>
```

Call of Qcrumb.com

Datechart visualisation

Variable (template is used)

SPARQL for values

SMART: Current work

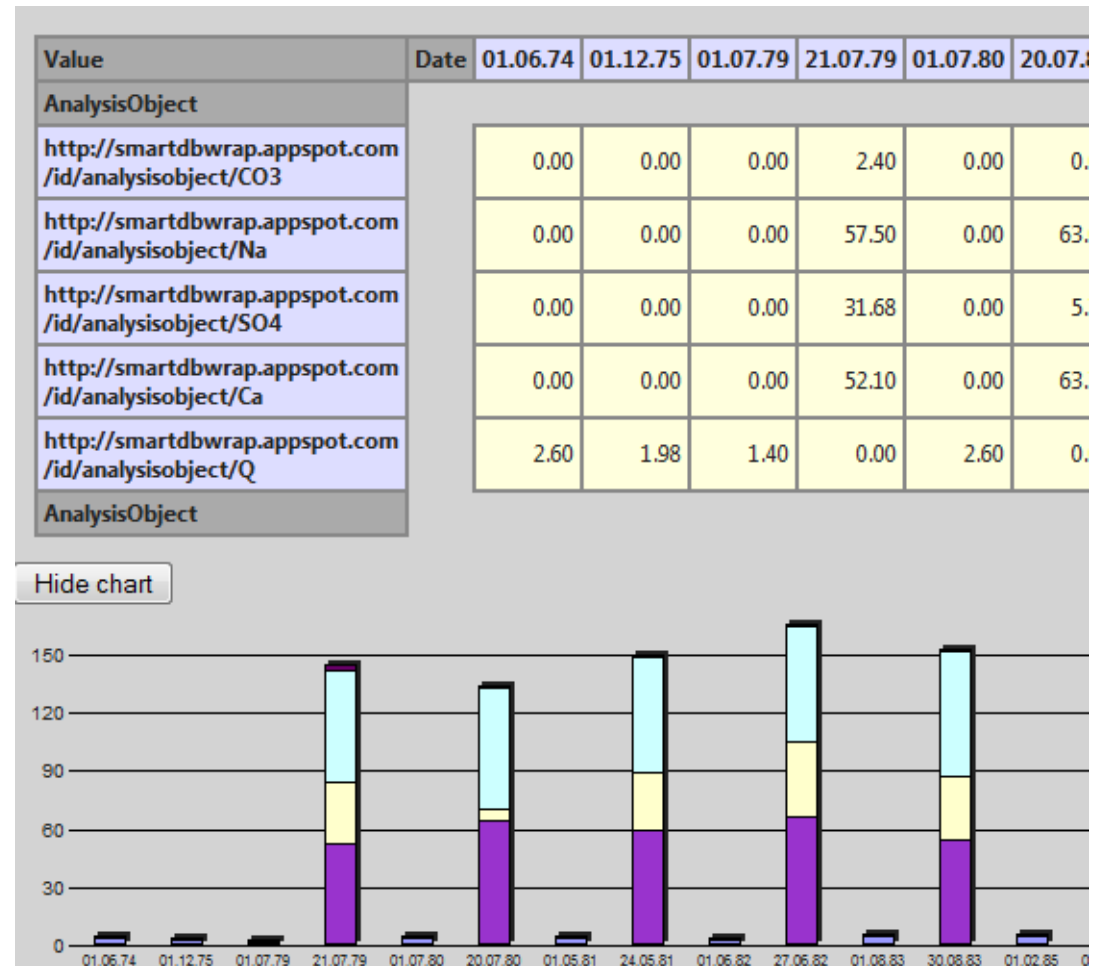
- Status: Simple analyses possible inside Dropedia.
- Problem: More complex analyses – Excel-like (!)
- Wanted: Interactive, navigational operations
 - Views/angles, dimensions, e.g., location, time
 - Measures, e.g., average GDP (count, sum...)
 - Drill-down/Roll-up (granularity, e.g., federal states)
 - Slice/Dice (filter, e.g., Germany, years after 2000)

SMART: Current work

■ Pivot analysis in SMW

Example

- Rows: metrics, e.g., average Natrium content in a specific spring
- Columns: over time



Demo: <http://localhost:8888/locationdatasetexample.html>

Thanks!

